



Minnesota Department of Natural Resources
 Fisheries Management
 STANDARD LAKE SURVEY REPORT



Lake Name: Cedar
 DOW Number: 01-0209-00

Survey Type: Re-Survey
 Survey ID Date: 08/11/2014

Lake Identification

Alternate Lake Name: N/A
 Primary Lake Class ID: 25
 DNR Sounding Map Number: B0001
 Alternate Lake Class ID: N/A

Lake Location

Primary County: Aitkin
 Nearest Town: Aitkin
 All Counties: Aitkin, Crow Wing.

Legal Descriptions

Lake Center: Township - 46N Range - 27W Section - 6
 PLS Section Lake Center: 4602706

All Legal Descriptions:

Aitkin County: Township - 46N Range - 27W Sections - 4, 5, 6, 7
 Township - 47N Range - 27W Sections - 29, 31, 32, 33
 Crow Wing County: Township - 46N Range - 28W Sections - 1, 11, 12

Area Office

Area Name: Aitkin
 Region Name: Northeast
 ORG Code: F211
 Region Number: 2

Lake Access

(Information based on Re-Survey dated 08/11/1997)

Station ID	Ownership	Public Use	Type	Location / Comments
AC - 1	DNR	Open to Public use	Concrete	located in T46N; R27W; Section 7; can be reached from CSAH 28 via T1022.

Lake Characteristics

Lake Area (planimetered acres): 1769.00
 GIS Lake Area (acres): 1745.28
 DOW Lake Area (acres): 1778.00
 Littoral Area (acres): 405.00
 Area in MN (acres): 1745.27
 Maximum Depth (feet): 105.0
 Mean Depth (feet): 28.0
 GIS Shoreline Length (miles): 27.70
 Maximum Fetch (miles): 3.55
 Fetch Orientation (degrees): 360
 USGS Quad Map Number: M14a
 USGS Quad 24K GIS Index: 2428

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Watershed Characteristics

Major Watershed

Name: Miss R-Brainerd
 Watershed Number: 10
 Watershed size (acres): 1,076,295

Minor Watershed

Name: Cedar Cr
 Watershed Number: 33
 Watershed size (acres): 15,708

Surveys And Investigations

Initial Survey: 06/29/1959.

Re-Survey: 08/11/2014, 08/11/1997, 08/18/1981, 07/25/1977.

Population Assessment: 08/15/2011, 08/13/2007, 08/12/2002, 08/03/1992, 08/10/1987.

Special Assessment: 08/04/2014, 07/21/2014, 08/07/2013, 08/10/2012, 05/03/2011, 08/20/2010, 08/13/2009, 04/20/2004, 04/27/2000, 04/21/1993, 08/04/1992, 08/11/1987, 08/27/1964, 08/30/1950.

Current Water Level

Station ID	Date	Level	Reading (feet)	Reading Type
BM - 1	08/13/2014	High	0.80	Above or below Benchmark

Benchmark and Gauge Descriptions / Locations

Station ID	Location Description
BM - 1	N/A

Water Level History - Readings

Station ID	Date	Level	Reading (feet)	Reading Type
BM - 1	08/13/2014	High	0.80	Above or below Benchmark

Water Level History - Station Summary

Station ID	Minimum Level		Maximum Level		Range (feet)	Average Level (feet)	Reading Type (and number of readings)
	Feet	Date	Feet	Date			
BM - 1	0.80	08/13/2014	0.80	08/13/2014	0.00	0.80	Above or below Benchmark (1)

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Lake Inlets

(Field work conducted on 08/11/2014)

Station ID	Name	Kittle Number	Origin and Cover Type (Primary and Secondary)	Surface Temp (°F)
IN - 1		N/A	Origin - N/A Cover Type - N/A	N/A
IN - 2		N/A	Lake Cover Type - N/A	75.0
IN - 3	Cedar Brook	N/A	Lake Cover Type - N/A	75.0
IN - 4		N/A	Origin - N/A Cover Type - N/A	75.0
IN - 5		N/A	Lake Cover Type - N/A	75.0
IN - 6		N/A	Lake Cover Type - N/A	75.0
IN - 8		N/A	Lake Cover Type - N/A	75.0
IN - 9		N/A	Origin - N/A Cover Type - N/A	N/A

Additional Inlet Information

Station ID	Mean Width (feet)	Mean Depth (feet)	Discharge (CFS)	Mean Velocity (FPS)	Barriers to Fish Movement	Known Fish Spawning Runs
IN - 1	0.00	0.00	0.0	0.00	N/A	N/A
IN - 2	40.00	0.00	0.0	0.00	Unknown	N/A
IN - 3	30.00	1.00	0.0	0.00	N/A	N/A
IN - 4	50.00	3.00	0.0	0.00	No	N/A
IN - 5	35.00	1.00	0.0	0.00	No	N/A
IN - 6	0.00	0.00	0.0	0.00	Yes	N/A
IN - 8	0.00	0.00	0.0	0.00	Yes	N/A
IN - 9	1.00	0.10	0.3	0.00	Yes	N/A

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Lake Outlets

(Field work conducted on 08/11/2014)

<u>Station ID</u>	<u>Name</u>	<u>Kittle Number</u>	<u>Tributary To</u>
OUT - 1	Cedar Brook	N/A	N/A

Additional Outlet Information

<u>Station ID</u>	<u>Mean Width (feet)</u>	<u>Mean Depth (feet)</u>	<u>Flow (CFS)</u>	<u>Mean Velocity (FPS)</u>	<u>Barriers to Fish Movement</u>	<u>Water Control Structure</u>
OUT - 1	20.00	2.00	0.00	1.0	Periodic	N/A

Surrounding Watershed Characteristics

<u>Use / Coverage</u>	<u>% Use</u>	<u>Relief</u>	<u>Location / Comments</u>
Forested	40	Rolling	N/A; Combined forest types
Marsh	36	Gradual	N/A; Woody and Emergent Wetlands
Pasture	10	Gradual	N/A
Residential	7	Gradual	N/A; Roads and Homes
Bog	5	Gradual	N/A; Open water not part of the lake
Agricultural	1	Gradual	N/A
Grassland	1	Gradual	N/A

Shoreline Characteristics

<u>Use / Coverage</u>	<u>% Use</u>	<u>Relief</u>	<u>Location / Comments</u>
Forested	65	Rolling	N/A
Residential	20	Gradual	N/A; Developed portions of residential lots
Marsh	15	Gradual	N/A

Riparian Landscape Observations

Soil Types (PPrimary and SSecondary): N/A
Soil Comments: N/A
Number of Homes/Cabins: 0
Comments About Shoreline Development: N/A

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Aquatic Vegetation And Shoalwater Substrates

Abundance Of Aquatic Plants (In Transects)

Number of Transects: 25

Maximum Depth of Aquatic Vegetation Sample (Feet): 13.0

Date(s) of Field Work: 08/12/2014 through 08/14/2014

<u>Common Name</u>	<u>Type</u>	<u>Frequency of Occurrence (%)</u>	<u>Abundance Rating</u>	<u>Mean Abundance (%)</u>
Arrowhead Group	Emergent	32	Rare	9.3
Bladderwort Group	Submergent	16	Rare	4.0
Bulrush Group	Emergent, Submergent	16	Rare	13.3
Burreed Group	-	12	Rare	2.0
Bushy Pondweed	Submergent	48	Rare	22.7
Canada Waterweed	Submergent	32	Rare	9.3
Cattail Group	Emergent	20	Rare	7.3
Clasping-leaf Pondweed	Submergent	84	Common	38.0
Common White Waterlily	Floating-leaf	56	Rare	25.3
Common Yellow Waterlily	Floating-leaf	52	Rare	30.0
Duckweed group	Free-Floating	12	Rare	6.0
Illinois Pondweed	Submergent	44	Rare	18.0
Muskgrass Group	-	44	Rare	26.0
Narrow-leaf Pondweed Group	Submergent	80	Rare	25.3
Northern Milfoil	Submergent	96	Common	45.3
Rice Group	Emergent	16	Rare	13.3
Robbins' pondweed	Submergent	56	Rare	24.0
Spikerush	Emergent	4	Rare	2.0
Variable -leaf Pondweed	Submergent	52	Rare	20.7
Water (wild) Celery	Submergent	12	Rare	3.3
Water Star-grass	Submergent	12	Rare	3.3
broad-leaved cattail	Emergent	28	Rare	10.0
common bladderwort	Submergent	20	Rare	6.0
coontail / Common hornwort	Submergent	72	Common	34.7
flat-stemmed pondweed	Submergent	80	Common	36.0
floating pondweed	Floating-leaf	12	Rare	2.0
hardstem bulrush	Emergent	48	Rare	26.7
large-leaved pondweed	Submergent	64	Rare	20.0
northern wild rice	Emergent	4	Rare	0.7
sago pondweed	Submergent	16	Rare	4.0
water marigold	Submergent	24	Rare	8.0
watershield	Floating-leaf	12	Rare	8.7
white-stemmed pondweed	Submergent	48	Rare	16.0

(Floating-Leaf and wetland species may be tallied with emergent species)

Shoalwater Substrates (In Transects)

<u>Common Name</u>	<u>Frequency of Occurrence (%)</u>	<u>Abundance Rating</u>	<u>Mean Abundance (%)</u>
Boulder	12	Rare	2.0
Detritus	8	Rare	6.7
Gravel	28	Rare	6.0
Marl	32	Rare	13.3
Muck	48	Common	34.7
Rubble	20	Rare	7.3
Sand	76	Common	51.3
Silt	36	Rare	19.3

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Dissolved Oxygen And Temperature Profile Of Lake Water

<u>Station ID</u>	<u>Sampling Date</u>	<u>Bottom Depth (Feet)</u>	<u>Sample Depth (Feet)</u>	<u>Water Temperature (°F)</u>	<u>Dissolved Oxygen (ppm)</u>
WQ - 1	08/11/2014	102.0	Surface	74.8	7.5
			5.0	74.8	7.5
			10.0	74.8	7.5
			15.0	71.4	5.8
			17.0	66.9	5.0
			20.0	64.9	5.0
			25.0	52.5	4.6
			30.0	47.7	4.3
			35.0	45.9	4.7
			40.0	45.0	4.7
			45.0	44.4	4.6
			50.0	43.9	4.6
			60.0	43.0	4.6
			70.0	42.4	4.0
			80.0	42.1	2.7
			90.0	41.9	1.7
			100.0	41.7	0.5
WQ - 2	08/11/2014	80.0	Surface	74.8	6.8
			5.0	74.8	6.8
			10.0	74.8	6.8
			12.0	74.8	6.7
			13.0	74.7	6.6
			14.0	73.0	4.0
			15.0	69.4	3.6
			16.0	64.8	1.8
			17.0	61.5	0.6
			20.0	53.2	0.6
			30.0	45.1	0.6
			40.0	43.3	0.2
			50.0	42.6	0.2
			60.0	42.3	0.2
70.0	42.3	0.2			
WQ - 3	08/11/2014	65.0	Surface	75.2	6.8
			5.0	75.2	6.8
			10.0	75.2	6.7
			13.0	71.2	4.6
			15.0	66.6	2.9
			17.0	61.2	0.2
			20.0	53.1	0.2
			25.0	46.2	0.2
			30.0	42.4	0.2
			40.0	41.7	0.2
			50.0	41.2	0.2
			60.0	41.0	0.2

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Field Measurements Of Water Quality

Station ID	Sampling Date	Sample Depth (Feet)	Secchi Depth (Feet)	Field pH	Alkalinity (ppm)	Water Color	Color Cause
WQ - 1	08/11/2014	Surface	12.0	N/A	N/A	Lt Green	Plankton
	07/21/2014	Surface	N/A	N/A	N/A	N/A	N/A
WQ - 2	08/11/2014	Surface	11.0	N/A	N/A	Lt Brown	Bog-stain
WQ - 3	08/11/2014	Surface	10.0	N/A	N/A	Lt Brown	Bog-stain

Laboratory Analysis Of Water Chemistry

Station ID	Sampling Date	Analysis Date	Sample Depth (ft)	Chemical Parameter	Chemical Value
WQ - 1	07/21/2014	07/30/2014	Surface	Sulphate ion	1.2 ppm
				Total phosphorus	0.017 ppm
				Total alkalinity	69 ppm
				Total dissolved solids	98 ppm
				Chlorophyll-a trichromatic method calculation	6.6 ppb
				Conductivity	141 :S/cm
				pH	7.39 pH
				Chlorophyll-a corrected for pheophytin	5.32 ppb

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Net Catch Summary by Numbers for GN

Standard gill net sets

Number of Sets: 20
First Set Date: 08/11/2014
Last Lift Date: 08/15/2014
Target Species: N/A

Abbr	Species	Total Fish	Number Per Set	Quartiles for Lake Class 25*		
				25%	50%	75%
BLC	Black Crappie	40	2.00	0.50	1.17	2.67
BLG	Bluegill	80	4.00	N/A	N/A	N/A
BOF	Bowfin (Dogfish)	2	0.10	0.13	0.20	0.36
HSF	Hybrid Sunfish	2	0.10	N/A	N/A	N/A
LMB	Largemouth Bass	17	0.85	0.25	0.45	1.18
MUE	Muskellunge	1	0.05	0.19	0.33	0.60
NOP	Northern Pike	122	6.10	3.13	5.25	8.50
PMK	Pumpkinseed	9	0.45	N/A	N/A	N/A
RKB	Rock Bass	8	0.40	0.33	0.71	2.00
SHR	Shorthead Redhorse	1	0.05	0.19	0.60	1.24
TLC	Tullibee (Cisco)	14	0.70	0.67	2.28	6.46
WAE	Walleye	42	2.10	1.25	3.00	5.50
WTS	White Sucker	1	0.05	0.50	1.33	3.50
YEB	Yellow Bullhead	2	0.10	0.88	2.67	10.00
YEP	Yellow Perch	7	0.35	2.50	9.00	24.17
Total Fish/Set:			17.40	* Quartiles for Number Per Set		

Net Catch Summary by Weight for GN

Standard gill net sets

Abbr	Species	Total Weight (Pounds)	Pounds Per Set	Mean Weight	Quartiles for Lake Class 25*		
					25%	50%	75%
BLC	Black Crappie	9.91	0.50	0.25	0.20	0.29	0.43
BLG	Bluegill	9.55	0.48	0.12	N/A	N/A	N/A
BOF	Bowfin (Dogfish)	15.40	0.77	7.70	2.90	3.85	5.00
HSF	Hybrid Sunfish	1.64	0.08	0.82	N/A	N/A	N/A
LMB	Largemouth Bass	9.06	0.45	0.53	0.50	0.77	1.10
MUE	Muskellunge	17.98	0.90	17.98	3.36	3.87	5.74
NOP	Northern Pike	258.71	12.94	2.12	1.48	2.01	2.66
PMK	Pumpkinseed	1.62	0.08	0.18	N/A	N/A	N/A
RKB	Rock Bass	5.23	0.26	0.65	0.25	0.38	0.50
SHR	Shorthead Redhorse	1.01	0.05	1.01	1.08	1.93	2.48
TLC	Tullibee (Cisco)	3.19	0.16	0.23	0.58	1.04	1.63
WAE	Walleye	166.35	8.32	3.96	1.15	1.68	2.40
WTS	White Sucker	1.82	0.09	1.82	1.61	2.00	2.40
YEB	Yellow Bullhead	2.45	0.12	1.23	0.45	0.59	0.74
YEP	Yellow Perch	0.64	0.03	0.09	0.10	0.13	0.18
Total Pounds Fish/Set:			25.23	* Quartiles for Mean Weight			

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Net Catch Summary by Numbers for GSU

Standard gill nets, suspended sets

Number of Sets: 2
 First Set Date: 08/13/2014
 Last Lift Date: 08/15/2014
 Target Species: N/A

Abbr	Species	Total Fish	Number Per Set	Quartiles for Lake Class 25*		
				25%	50%	75%
TLC	Tullibee (Cisco)	321	160.50	N/A	N/A	N/A
Total Fish/Set:			160.50	* Quartiles for Number Per Set		

Net Catch Summary by Weight for GSU

Standard gill nets, suspended sets

Abbr	Species	Total Weight (Pounds)	Pounds Per Set	Mean Weight	Quartiles for Lake Class 25*		
					25%	50%	75%
TLC	Tullibee (Cisco)	48.51	24.25	0.15	N/A	N/A	N/A
Total Pounds Fish/Set:			24.25	* Quartiles for Mean Weight			

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Net Catch Summary by Numbers for TN

Standard 3/4-in mesh, double frame trap net sets

Number of Sets: 24
 First Set Date: 08/11/2014
 Last Lift Date: 08/14/2014
 Target Species: N/A

Abbr	Species	Total Fish	Number Per Set	Quartiles for Lake Class 25*		
				25%	50%	75%
BLC	Black Crappie	18	0.75	0.75	1.46	3.18
BLG	Bluegill	263	10.96	5.61	17.25	42.27
BOF	Bowfin (Dogfish)	19	0.79	0.38	0.60	1.00
BRB	Brown Bullhead	2	0.08	0.33	0.78	1.50
HSF	Hybrid Sunfish	33	1.38	N/A	N/A	N/A
LMB	Largemouth Bass	11	0.46	0.25	0.52	1.07
NOP	Northern Pike	14	0.58	N/A	N/A	N/A
PMK	Pumpkinseed	18	0.75	1.69	3.40	8.22
RKB	Rock Bass	14	0.58	0.59	1.26	2.46
SHR	Shorthead Redhorse	1	0.04	0.25	0.87	3.91
WAE	Walleye	3	0.13	0.20	0.38	0.68
YEB	Yellow Bullhead	2	0.08	1.50	3.50	7.69
YEP	Yellow Perch	5	0.21	0.50	1.27	2.67
Total Fish/Set:			16.79	* Quartiles for Number Per Set		

Net Catch Summary by Weight for TN

Standard 3/4-in mesh, double frame trap net sets

Abbr	Species	Total Weight (Pounds)	Pounds Per Set	Mean Weight	Quartiles for Lake Class 25*		
					25%	50%	75%
BLC	Black Crappie	4.65	0.19	0.26	0.24	0.33	0.47
BLG	Bluegill	31.31	1.30	0.12	0.13	0.18	0.26
BOF	Bowfin (Dogfish)	101.36	4.22	5.33	3.08	4.00	4.75
BRB	Brown Bullhead	1.92	0.08	0.96	0.60	0.79	1.00
HSF	Hybrid Sunfish	5.35	0.22	0.16	N/A	N/A	N/A
LMB	Largemouth Bass	5.08	0.21	0.46	0.23	0.45	0.89
NOP	Northern Pike	29.01	1.21	2.07	N/A	N/A	N/A
PMK	Pumpkinseed	2.27	0.09	0.13	0.13	0.17	0.24
RKB	Rock Bass	5.95	0.25	0.42	0.23	0.33	0.47
SHR	Shorthead Redhorse	1.46	0.06	1.46	1.24	2.18	2.93
WAE	Walleye	13.70	0.57	4.57	0.94	1.66	2.86
YEB	Yellow Bullhead	1.56	0.06	0.78	0.53	0.65	0.81
YEP	Yellow Perch	0.47	0.02	0.09	0.10	0.14	0.22
Total Pounds Fish/Set:			8.50	* Quartiles for Mean Weight			

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Length Frequency Distribution For GN (for fish < 36.00 inches)

Standard gill net sets

(Field work conducted between 08/11/2014 and 08/15/2014)

	<u>BLC</u>	<u>BLG</u>	<u>BOF</u>	<u>HSF</u>	<u>LMB</u>	<u>MUE</u>	<u>NOP</u>	<u>PMK</u>	<u>RKB</u>	<u>SHR</u>	<u>TLC</u>	<u>WAE</u>	<u>WTS</u>	<u>YEB</u>	<u>YEP</u>
< 3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.00 - 3.49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.50 - 3.99	-	18	-	-	-	-	-	-	-	-	-	-	-	-	-
4.00 - 4.49	1	16	-	-	-	-	-	-	-	-	-	-	-	-	-
4.50 - 4.99	1	5	-	-	-	-	-	3	-	-	-	-	-	-	-
5.00 - 5.49	-	7	-	-	1	-	-	1	-	-	-	-	-	-	-
5.50 - 5.99	3	11	-	-	3	-	-	1	-	-	-	-	-	-	5
6.00 - 6.49	1	11	-	-	1	-	-	2	-	-	-	-	-	-	2
6.50 - 6.99	4	6	-	-	-	-	-	1	-	-	2	-	-	-	-
7.00 - 7.49	6	4	-	-	-	-	-	-	-	-	4	-	-	-	-
7.50 - 7.99	5	1	-	-	-	-	-	1	1	-	-	-	-	-	-
8.00 - 8.49	10	-	-	-	1	-	-	-	-	-	2	1	-	-	-
8.50 - 8.99	3	1	-	1	1	-	-	-	1	-	-	-	-	-	-
9.00 - 9.49	5	-	-	-	1	-	-	-	1	-	1	-	-	-	-
9.50 - 9.99	-	-	-	1	1	-	-	-	4	-	1	-	-	-	-
10.00 - 10.49	-	-	-	-	3	-	-	-	1	-	2	-	-	-	-
10.50 - 10.99	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-
11.00 - 11.49	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
11.50 - 11.99	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
12.00 - 12.99	-	-	-	-	2	-	-	-	-	-	1	-	-	1	-
13.00 - 13.99	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-
14.00 - 14.99	-	-	-	-	1	-	2	-	-	-	-	1	-	-	-
15.00 - 15.99	-	-	-	-	-	-	2	-	-	-	-	1	-	-	-
16.00 - 16.99	-	-	-	-	-	-	5	-	-	-	-	-	1	-	-
17.00 - 17.99	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-
18.00 - 18.99	-	-	-	-	-	-	12	-	-	-	-	5	-	-	-
19.00 - 19.99	-	-	-	-	-	-	11	-	-	-	-	4	-	-	-
20.00 - 20.99	-	-	-	-	-	-	10	-	-	-	-	5	-	-	-
21.00 - 21.99	-	-	-	-	-	-	15	-	-	-	-	4	-	-	-
22.00 - 22.99	-	-	-	-	-	-	15	-	-	-	-	6	-	-	-
23.00 - 23.99	-	-	-	-	-	-	10	-	-	-	-	2	-	-	-
24.00 - 24.99	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-
25.00 - 25.99	-	-	-	-	-	-	8	-	-	-	-	1	-	-	-
26.00 - 26.99	-	-	1	-	-	-	7	-	-	-	-	3	-	-	-
27.00 - 27.99	-	-	-	-	-	-	4	-	-	-	-	3	-	-	-
28.00 - 28.99	-	-	-	-	-	-	2	-	-	-	-	1	-	-	-
29.00 - 29.99	-	-	1	-	-	-	-	-	-	-	-	2	-	-	-
30.00 - 30.99	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
31.00 - 31.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32.00 - 32.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33.00 - 33.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34.00 - 34.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35.00 - 35.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
= > 36.00	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
	<u>BLC</u>	<u>BLG</u>	<u>BOF</u>	<u>HSF</u>	<u>LMB</u>	<u>MUE</u>	<u>NOP</u>	<u>PMK</u>	<u>RKB</u>	<u>SHR</u>	<u>TLC</u>	<u>WAE</u>	<u>WTS</u>	<u>YEB</u>	<u>YEP</u>
Total	40	80	2	2	17	1	122	9	8	1	14	42	1	2	7
Min. Length	4.33	3.66	26.93	8.94	5.08	41.73	14.72	4.69	7.72	13.54	6.57	8.11	16.34	12.44	5.59
Max. Length	10.75	8.86	29.72	9.69	14.25	41.73	28.94	7.56	10.43	13.54	12.64	30.31	16.34	13.58	6.26
Mean Length	7.67	5.17	28.33	9.31	9.23	41.73	21.60	5.80	9.35	13.54	8.60	21.94	16.34	13.01	5.97
# Measured	40	80	2	2	17	1	122	9	8	1	14	42	1	2	7
No Lengths for	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: Unless all fish were measured in the catch, totals shown for some length-frequency distributions may differ from the total number of fish in the catch, due to rounding of fractions used in the estimation of length frequency from a subsample of measured fish

STANDARD LAKE SURVEY REPORT
RE-SURVEY DATED 08/11/2014 FOR DOW NUMBER 01-0209-00

Length Frequency Distribution For GN (for fish \geq 36.00 inches)

Standard gill net sets

(Field work conducted between 08/11/2014 and 08/15/2014)

	<u>BLC</u>	<u>BLG</u>	<u>BOF</u>	<u>HSF</u>	<u>LMB</u>	<u>MUE</u>	<u>NOP</u>	<u>PMK</u>	<u>RKB</u>	<u>SHR</u>	<u>TLC</u>	<u>WAE</u>	<u>WTS</u>	<u>YEB</u>	<u>YEP</u>
< 36.00	40	80	2	2	17	-	122	9	8	1	14	42	1	2	7
36.00 - 36.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37.00 - 37.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38.00 - 38.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39.00 - 39.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40.00 - 40.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41.00 - 41.99	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
42.00 - 42.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43.00 - 43.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44.00 - 44.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45.00 - 45.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46.00 - 46.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47.00 - 47.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48.00 - 48.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
49.00 - 49.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50.00 - 50.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51.00 - 51.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52.00 - 52.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53.00 - 53.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54.00 - 54.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55.00 - 55.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56.00 - 56.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
57.00 - 57.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58.00 - 58.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59.00 - 59.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60.00 - 60.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61.00 - 61.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
62.00 - 62.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63.00 - 63.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
64.00 - 64.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65.00 - 65.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
66.00 - 66.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
67.00 - 67.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
68.00 - 68.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
69.00 - 69.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70.00 - 70.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
71.00 - 71.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
72.00 - 72.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
73.00 - 73.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
74.00 - 74.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75.00 - 75.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
76.00 - 76.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
77.00 - 77.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
= > 78.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	40	80	2	2	17	1	122	9	8	1	14	42	1	2	7
Min. Length	4.33	3.66	26.93	8.94	5.08	41.73	14.72	4.69	7.72	13.54	6.57	8.11	16.34	12.44	5.59
Max. Length	10.75	8.86	29.72	9.69	14.25	41.73	28.94	7.56	10.43	13.54	12.64	30.31	16.34	13.58	6.26
Mean Length	7.67	5.17	28.33	9.31	9.23	41.73	21.60	5.80	9.35	13.54	8.60	21.94	16.34	13.01	5.97
# Measured	40	80	2	2	17	1	122	9	8	1	14	42	1	2	7
No Lengths for	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: Unless all fish were measured in the catch, totals shown for some length-frequency distributions may differ from the total number of fish in the catch, due to rounding of fractions used in the estimation of length frequency from a subsample of measured fish

STANDARD LAKE SURVEY REPORT
RE-SURVEY DATED 08/11/2014 FOR DOW NUMBER 01-0209-00

Length Frequency Distribution For GSU

Standard gill nets, suspended sets

(Field work conducted between 08/13/2014 and 08/15/2014)

	<u>TLC</u>
< 3.00	-
3.00 - 3.49	-
3.50 - 3.99	-
4.00 - 4.49	-
4.50 - 4.99	-
5.00 - 5.49	-
5.50 - 5.99	-
6.00 - 6.49	11
6.50 - 6.99	122
7.00 - 7.49	79
7.50 - 7.99	17
8.00 - 8.49	10
8.50 - 8.99	33
9.00 - 9.49	18
9.50 - 9.99	12
10.00 - 10.49	6
10.50 - 10.99	6
11.00 - 11.49	3
11.50 - 11.99	2
12.00 - 12.99	2
13.00 - 13.99	-
14.00 - 14.99	-
15.00 - 15.99	-
16.00 - 16.99	-
17.00 - 17.99	-
18.00 - 18.99	-
19.00 - 19.99	-
20.00 - 20.99	-
21.00 - 21.99	-
22.00 - 22.99	-
23.00 - 23.99	-
24.00 - 24.99	-
25.00 - 25.99	-
26.00 - 26.99	-
27.00 - 27.99	-
28.00 - 28.99	-
29.00 - 29.99	-
30.00 - 30.99	-
31.00 - 31.99	-
32.00 - 32.99	-
33.00 - 33.99	-
34.00 - 34.99	-
35.00 - 35.99	-
= > 36.00	-

	<u>TLC</u>
Total	321
Min. Length	6.14
Max. Length	12.09
Mean Length	8.07
# Measured	193
No Lengths for	128

Note: Unless all fish were measured in the catch, totals shown for some length-frequency distributions may differ from the total number of fish in the catch, due to rounding of fractions used in the estimation of length frequency from a subsample of measured fish

STANDARD LAKE SURVEY REPORT
RE-SURVEY DATED 08/11/2014 FOR DOW NUMBER 01-0209-00

Length Frequency Distribution For TN

Standard 3/4-in mesh, double frame trap net sets

(Field work conducted between 08/11/2014 and 08/14/2014)

	<u>BLC</u>	<u>BLG</u>	<u>BOF</u>	<u>BRB</u>	<u>HSF</u>	<u>LMB</u>	<u>NOP</u>	<u>PMK</u>	<u>RKB</u>	<u>SHR</u>	<u>WAE</u>	<u>YEB</u>	<u>YEP</u>
< 3.00	-	-	-	-	-	-	-	-	-	-	-	-	-
3.00 - 3.49	-	12	-	-	5	-	-	4	-	-	-	-	-
3.50 - 3.99	-	68	-	-	3	-	-	1	1	-	-	-	-
4.00 - 4.49	-	33	-	-	8	-	-	-	1	-	-	-	-
4.50 - 4.99	-	21	-	-	2	-	-	5	-	-	-	-	-
5.00 - 5.49	1	28	-	-	3	-	-	1	3	-	-	-	-
5.50 - 5.99	1	20	-	-	1	3	-	2	1	-	-	-	2
6.00 - 6.49	1	22	-	-	2	1	-	2	-	-	-	-	2
6.50 - 6.99	-	29	-	-	3	-	-	2	-	-	-	-	1
7.00 - 7.49	4	15	-	-	1	-	-	1	-	-	-	-	-
7.50 - 7.99	5	12	-	-	3	-	-	-	-	-	-	-	-
8.00 - 8.49	-	3	-	-	2	-	-	-	-	-	-	-	-
8.50 - 8.99	1	-	-	-	-	1	-	-	3	-	-	-	-
9.00 - 9.49	2	-	-	-	-	1	-	-	1	-	-	-	-
9.50 - 9.99	2	-	-	-	-	1	-	-	2	-	-	-	-
10.00 - 10.49	1	-	-	-	-	1	-	-	2	-	-	-	-
10.50 - 10.99	-	-	-	-	-	1	-	-	-	-	-	1	-
11.00 - 11.49	-	-	-	-	-	1	1	-	-	-	-	-	-
11.50 - 11.99	-	-	-	-	-	-	-	-	-	-	-	1	-
12.00 - 12.99	-	-	-	2	-	-	-	-	-	-	-	-	-
13.00 - 13.99	-	-	-	-	-	-	-	-	-	-	1	-	-
14.00 - 14.99	-	-	-	-	-	1	-	-	-	-	-	-	-
15.00 - 15.99	-	-	-	-	-	-	-	-	-	1	-	-	-
16.00 - 16.99	-	-	-	-	-	-	-	-	-	-	-	-	-
17.00 - 17.99	-	-	-	-	-	-	-	-	-	-	-	-	-
18.00 - 18.99	-	-	1	-	-	-	1	-	-	-	-	-	-
19.00 - 19.99	-	-	1	-	-	-	-	-	-	-	-	-	-
20.00 - 20.99	-	-	-	-	-	-	8	-	-	-	-	-	-
21.00 - 21.99	-	-	-	-	-	-	2	-	-	-	-	-	-
22.00 - 22.99	-	-	4	-	-	-	-	-	-	-	1	-	-
23.00 - 23.99	-	-	3	-	-	-	-	1	-	-	-	-	-
24.00 - 24.99	-	-	1	-	-	-	-	-	-	-	-	-	-
25.00 - 25.99	-	-	1	-	-	-	-	-	-	-	-	-	-
26.00 - 26.99	-	-	3	-	-	-	-	-	-	-	-	-	-
27.00 - 27.99	-	-	2	-	-	-	-	-	-	-	-	-	-
28.00 - 28.99	-	-	1	-	-	-	-	-	-	-	-	-	-
29.00 - 29.99	-	-	2	-	-	-	-	-	-	-	1	-	-
30.00 - 30.99	-	-	-	-	-	-	1	-	-	-	-	-	-
31.00 - 31.99	-	-	-	-	-	-	-	-	-	-	-	-	-
32.00 - 32.99	-	-	-	-	-	-	-	-	-	-	-	-	-
33.00 - 33.99	-	-	-	-	-	-	-	-	-	-	-	-	-
34.00 - 34.99	-	-	-	-	-	-	-	-	-	-	-	-	-
35.00 - 35.99	-	-	-	-	-	-	-	-	-	-	-	-	-
= > 36.00	-	-	-	-	-	-	-	-	-	-	-	-	-

	<u>BLC</u>	<u>BLG</u>	<u>BOF</u>	<u>BRB</u>	<u>HSF</u>	<u>LMB</u>	<u>NOP</u>	<u>PMK</u>	<u>RKB</u>	<u>SHR</u>	<u>WAE</u>	<u>YEB</u>	<u>YEP</u>
Total	18	263	19	2	33	11	14	18	14	1	3	2	5
Min. Length	5.04	3.11	18.74	12.17	3.15	5.63	11.18	3.15	3.90	15.35	13.27	10.59	5.63
Max. Length	10.04	8.43	29.57	12.44	8.35	14.06	30.31	7.13	10.43	15.35	29.33	11.85	6.89
Mean Length	7.87	5.13	24.72	12.30	5.28	8.83	20.80	5.02	7.52	15.35	21.65	11.22	6.13
# Measured	18	263	19	2	33	11	14	18	14	1	3	2	5
No Lengths for	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: Unless all fish were measured in the catch, totals shown for some length-frequency distributions may differ from the total number of fish in the catch, due to rounding of fractions used in the estimation of length frequency from a subsample of measured fish

STANDARD LAKE SURVEY REPORT
RE-SURVEY DATED 08/11/2014 FOR DOW NUMBER 01-0209-00

Length At Capture With Last Incremental Length

(Body-Scale constant, all lengths, and all length increments in inches)

Species: Black Crappie
Body-Scale Constant: 0.79
Total Sample Size: 50

Length at Capture in 2014 for Each Age Class, with Incremental Lengths for 2014

Year Class	Age	Sample Size	Length At Capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2013	1	3	4.72	5.04	4.33	0.208	1.25	0.244
2012	2	14	6.52	7.32	5.59	0.172	1.25	0.063
2011	3	19	7.76	8.27	7.32	0.075	0.92	0.054
2010	4	11	9.00	9.61	8.43	0.125	0.71	0.059
2009	5	3	9.51	10.04	9.25	0.262	0.49	0.044

Species: Largemouth Bass
Body-Scale Constant: 0.79
Total Sample Size: 17

Length at Capture in 2014 for Each Age Class, with Incremental Lengths for 2014

Year Class	Age	Sample Size	Length At Capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2013	1	5	5.64	6.18	5.08	0.178	2.30	0.292
2012	2	2	8.52	8.66	8.39	0.138	2.49	0.097
2011	3	5	9.94	10.35	9.13	0.230	1.61	0.104
2010	4	4	11.94	12.91	11.30	0.386	0.97	0.230
2009	5	1	14.25	14.25	14.25	N/A	0.65	N/A

Species: Walleye
Body-Scale Constant: 1.10
Total Sample Size: 10

Length at Capture in 2014 for Each Age Class, with Incremental Lengths for 2014

Year Class	Age	Sample Size	Length At Capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2013	1	1	8.11	8.11	8.11	N/A	1.95	N/A
2012	2	1	11.85	11.85	11.85	N/A	3.37	N/A
2011	3	0	-	-	-	-	-	-
2010	4	3	17.14	18.58	14.49	1.327	1.32	0.108
2009	5	5	19.65	20.12	18.74	0.247	1.03	0.081

Species: Yellow Perch
Body-Scale Constant: 1.18
Total Sample Size: 6

Length at Capture in 2014 for Each Age Class, with Incremental Lengths for 2014

Year Class	Age	Sample Size	Length At Capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2011	3	6	6.04	6.26	5.87	0.067	0.84	0.075

STANDARD LAKE SURVEY REPORT
RE-SURVEY DATED 08/11/2014 FOR DOW NUMBER 01-0209-00

STANDARD LAKE SURVEY REPORT
RE-SURVEY DATED 08/11/2014 FOR DOW NUMBER 01-0209-00

Back-Calculated Lengths for Each Age Class and Average Annual Increments of Back-Calculated Lengths

Species: Black Crappie

Gear Type: Combined Gear Types (GN and TN)

Class	Age	N	1	2	3	4	5
2013	1	3	3.48	-	-	-	-
			3.48	-	-	-	-
2012	2	14	3.27	5.27	-	-	-
			3.27	1.99	-	-	-
2011	3	19	3.01	5.01	6.84	-	-
			3.01	2.00	1.82	-	-
2010	4	11	3.25	5.22	7.01	8.29	-
			3.25	1.97	1.79	1.28	-
2009	5	3	3.22	5.51	7.01	8.17	9.02
			3.22	2.29	1.50	1.16	0.86
Mean Length			3.18	5.17	6.91	8.27	9.02
Mean Increment			3.18	2.01	1.78	1.25	0.86
Total N			50	47	33	14	3

Species: Largemouth Bass

Gear Type: Combined Gear Types (GN)

Class	Age	N	1	2	3	4	5
2013	1	5	3.34	-	-	-	-
			3.34	-	-	-	-
2012	2	2	3.43	6.04	-	-	-
			3.43	2.61	-	-	-
2011	3	5	3.02	5.66	8.33	-	-
			3.02	2.64	2.67	-	-
2010	4	4	3.51	6.15	8.91	10.97	-
			3.51	2.64	2.76	2.06	-
2009	5	1	3.72	6.29	8.53	11.31	13.60
			3.72	2.57	2.24	2.78	2.29
Mean Length			3.32	5.94	8.58	11.04	13.60
Mean Increment			3.32	2.63	2.66	2.20	2.29
Total N			17	12	10	5	1

Species: Walleye

Gear Type: Combined Gear Types (GN)

Class	Age	N	1	2	3	4	5
2013	1	1	6.16	-	-	-	-
			6.16	-	-	-	-
2012	2	1	5.23	8.48	-	-	-
			5.23	3.25	-	-	-
2010	4	3	5.65	9.02	13.43	15.82	-
			5.65	3.37	4.41	2.39	-
2009	5	5	6.47	11.05	14.49	16.82	18.62
			6.47	4.58	3.44	2.33	1.79
Mean Length			6.07	10.09	14.09	16.45	18.62
Mean Increment			6.07	4.03	3.81	2.35	1.79
Total N			10	9	8	8	5

STANDARD LAKE SURVEY REPORT
RE-SURVEY DATED 08/11/2014 FOR DOW NUMBER 01-0209-00

Back-Calculated Lengths for Each Age Class and Average Annual Increments of Back-Calculated Lengths (Continued)

Species: Yellow Perch

Gear Type: Combined Gear Types (GN)

Class	Age	N	1	2	3
2011	3	6	2.48	3.92	5.20
			2.48	1.45	1.27
Mean Length			2.48	3.92	5.20
Mean Increment			2.48	1.45	1.27
Total N			6	6	6

STANDARD LAKE SURVEY REPORT
RE-SURVEY DATED 08/11/2014 FOR DOW NUMBER 01-0209-00

Age Class Frequency Distribution

Species and Gear (1)	Number of Fish (2)			Number of Fish in Year Class ('yy) and Age Class															
	Aged	Keyed	Unaged	'14 0	'13 1	'12 2	'11 3	'10 4	'09 5	'08 6	'07 7	'06 8	'05 9	'04 10	'03 11	'02 12	'01 13	'00 14	<'00 15+
Black Crappie																			
GN	34	6	0	0	2	13	14	9	1	1	0	0	0	0	0	0	0	0	0
TN	17	1	0	0	1	2	9	4	2	0	0	0	0	0	0	0	0	0	0
Totals:	51	7	0	0	3	15	23	13	3	1	0	0	0	0	0	0	0	0	0
Largemouth Bass																			
GN	17	0	0	0	5	2	5	4	1	0	0	0	0	0	0	0	0	0	0
Tullibee (Cisco)																			
GSU	60	261	0	0	84	141	40	22	15	14	3	2	0	0	0	0	0	0	0
Walleye																			
GN	36	3	3	0	1	1	0	3	6	2	4	7	2	2	3	0	3	3	2
Yellow Perch																			
GN	6	1	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0

(1) Key to sampling gear abbreviations:

- GN = Standard gill net sets
- TN = Standard 3/4-in mesh, double frame trap net sets
- GSU = Standard gill nets, suspended sets

(2) Notes:

- Number of Fish Aged: Fish that were aged from bony parts.
- Number of Fish Keyed: Fish assigned an age with an age-length key or by expansion of mesh or station age distributions.
- Number of Fish Unaged: Fish that were not aged and were not assigned an age.

Other Species

Gear Type (1)	Other Species (Gender) (2)	Total	Number	Length (inches)	Number	Weight (pounds)
		Num	Measured	Min - Mean - Max	Weighed	Min - Mean - Max
TN	Painted Turtle	18	0	N/A	0	N/A
	Snapping Turtle	5	5	10.83 - 13.27 - 15.75	0	N/A

(1) Key to sampling gear abbreviations:

- TN = Standard 3/4-in mesh, double frame trap net sets

(2) Gender: If identified and reported.

Survey Crew Notes

null

Region Signed by user 'tokalish' on 03/31/2015

Area Signed by user 'tokalish' on 03/31/2015

Region Signed by user 'tokalish' on 03/31/2015

Area Signed by user 'tokalish' on 03/31/2015

Area Signed by user 'tokalish' on 03/31/2015

Region Signed by user 'jomix' on 04/27/2015

Discussion

A resurvey was conducted the week of August 11, 2014 to provide an update of the current fish community. In addition to the standard survey work, IBI (Index of Biotic Integrity) sampling using backpack electrofishing and seining was also conducted in 2014, to more broadly sample the general fish community and develop a fish-based index of overall lake health (see Cedar SA 8/4/2014). IBI program staff also conducted additional vertical gill netting and hydroacoustic sampling during the summer of 2014.

Cedar Lake is within the Mississippi River drainage and the immediate watershed (DNR Level 8 watershed) drains an area of approximately 6,800 acres. Land cover in the watershed is primarily forests and wetlands, with most of the remaining land a mix of residential development and pasture. While residential development exists in most bays of the lake, much of the shoreline is forested and is in a relatively natural condition. Diverse nearshore substrates include areas with muck, gravel, rubble, and boulders, with sand observed most frequently along vegetation transects. The water has good clarity and can occasionally have a light bog stained (brown) or plankton influenced (green) color.

Temperature - dissolved oxygen (TDO) profiles were collected from the main basin (WQ1) and two secondary basins (WQ2, WQ3) on August 11, 2014, to measure the amount of thermal habitat available for tullibee. The main basin represents the area most likely to have adequate conditions for tullibee survival and the TDO3 (temperature at 3 mg/l dissolved oxygen) from WQ1 was determined to be 6 degrees C. Overall oxy-thermal habitat in the main basin was good, with favorable conditions occurring from about 10 feet deep to the bottom. Unlike many years, adequate conditions for tullibee survival also existed in both of the secondary basins in 2013 and 2014. Data collected from 2009-2014 indicate the main basin has had sufficient thermal habitat for tullibee survival in each year surveyed and provides "good" habitat compared to other area lakes that are monitored. However, in 2009, there was a strong partial kill of tullibee in the main basin as well as the furthest north basin when oxy-thermal habitat fell below the lethal level for tullibee in late September. Because the Aitkin Area is located near the southern edge of Minnesota's tullibee range, TDO profiles should continue to be collected to monitor the availability of coldwater habitat.

Walleye and muskellunge are the two primary management species and each are stocked as fall fingerlings annually. Additional spring muskellunge sampling was conducted in 2011, and will continue with every other survey, next in 2017, as per the current plan. The walleye catch rate of 2.1/gill net was below the lake class median and goal of the plan (3.0/gill net) for the second consecutive survey, but above the average (1.8/gill net) from nine previous fish surveys. Age analysis revealed walleye ages 1-16, with several individuals greater than 10 years old, indicating fish regularly survive to old age. Interestingly, walleye ages 6 and older were caught at almost double the rate as those same year classes were captured in 2011, at ages 3 and older. This exemplifies variability in gill net catchability. Similar to previous surveys, size structure was good with fish over 30" observed in the sample. The mean weight of walleye was 4 pounds and was the highest that has been observed.

Secondary management species include largemouth bass, black crappie and northern pike. Spring night electrofishing for largemouth bass was not conducted in 2014, due to area work priorities. Largemouth bass catch rate (0.9/gill net) was similar to the previous survey and has been stable near 1/gill net since 2002. Bass ranged from age 1-5 with each

Discussion (Continued)

year class represented in the sample.

Black crappie catch rate (2.0/gill net) was the lowest of the nine surveys dating back to 1959. Sizes ranged from 4.3 to 10.8" and averaged 7.7", with only one fish greater than 10". Age analysis revealed crappie ages 1-6, with each year class represented in the sample and the 2011 year class contributing 40% of the catch.

Bluegill catch rate (11.0/net) was similar to previous two surveys, and included fish over 8" for the first time since 1959.

Northern pike catch rate (6.1/gill net) decreased compared to the 2011 catch rate of 7.9/gill net (Wilcoxon Signed Rank Test: $p=0.11$, $n=15$). Pike catches have ranged from 2.7 to 8.6/gill net in nine previous surveys, which is typical for this lake class. Sizes in the gill net sample ranged from 14.7 to 28.9", and averaged 21.6" and 2.1 pounds, with 25% greater than 24".

Yellow perch catches have historically been below the interquartile range for lake class 25 and remained low in 2014 (0.4/gill net). All perch were from the 2011 year class.

Suspended gill nets targeting tullibee captured 160.5/net, the highest catch in five previous surveys using this gear type. Sizes ranged from 6.1 to 12.1" and averaged 8.1". Age analysis revealed tullibee ages 1-8, with each year class represented in the sample and 44% of the catch from the 2012 year class.

Status Of The Fishery

Cedar Lake is a large and popular lake located three miles west of the City of Aitkin. There is a state owned public access with a concrete log ramp located on the south side of the lake. The shoreline is complex with several distinct basins, which provides a variety of habitats ranging from shallow vegetated bays to cool and deep open water areas. The fish community reflects the diverse habitat, and besides gamefish includes several species of shiners, darters, and minnows present.

Walleye and muskellunge are the primary management species and both species are currently stocked annually as fingerlings to maintain their populations, although some natural reproduction of walleye likely occurs. The 2014 walleye catch was similar to previous assessments and generally on the lower end of the expected range for this type of lake. While walleye may not be overly abundant their population has a quality size component with fish over 30" sampled.

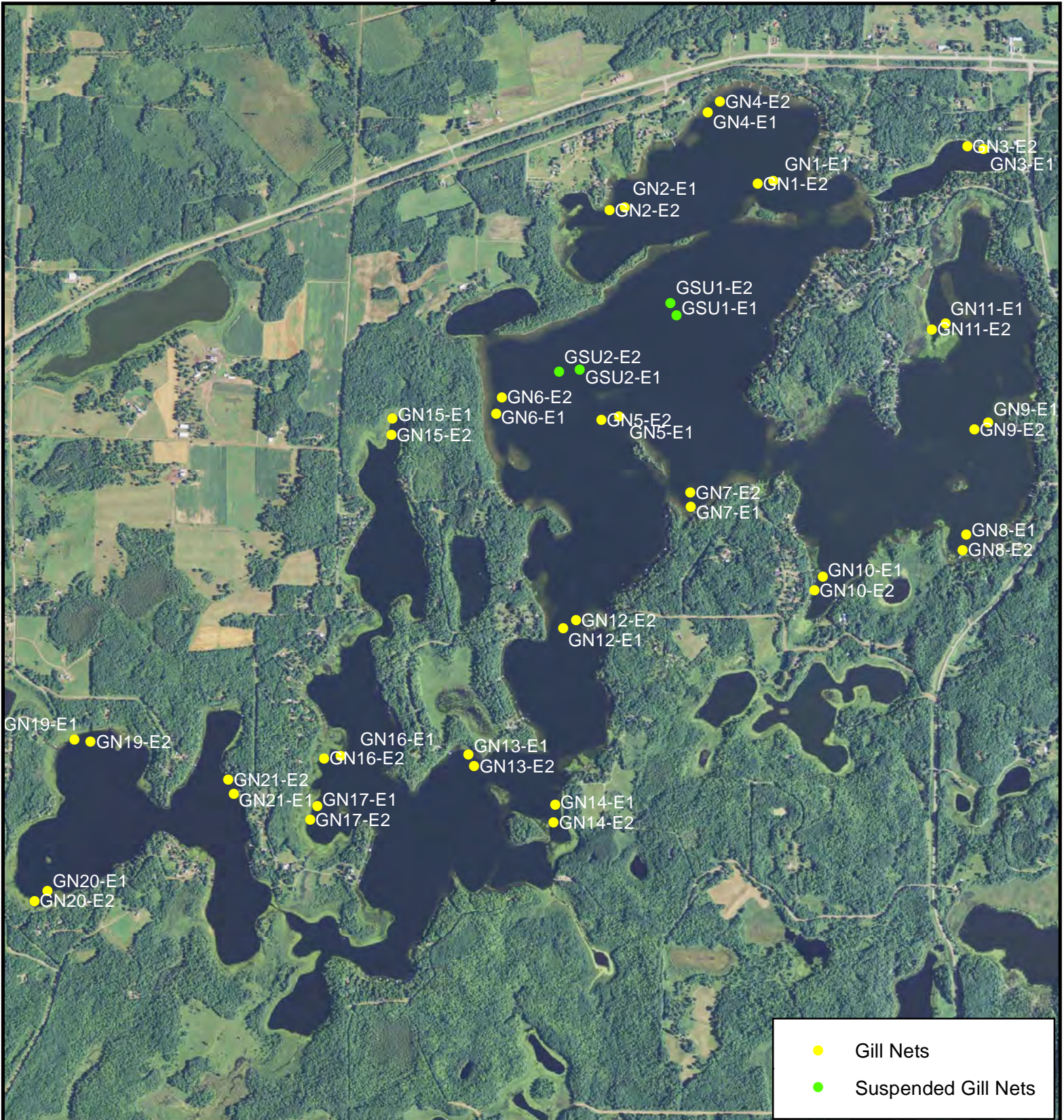
Muskellunge are not captured well in standard survey gear and only one fish was sampled in 2014. Special sampling targeting muskellunge is conducted every other survey and was completed last in 2011. A total of 22 muskellunge were sampled in that assessment, with fish ranging from 34.6 to 48.6" and an average length of 42.2". Despite not being sampled in high numbers in fisheries gear, angler reports suggest a healthy fishable population.

Largemouth bass are another popular species targeted by anglers that are not sampled well with standard survey gear. Bass captured in 2014 ranged from 5 to 14". Age analysis revealed fish from age 1 to age 5, with each year class represented in the sample.

The northern pike population provides anglers yet another opportunity to catch a top predator. While not able to attain the same maximum size as muskellunge, northern pike in Cedar Lake have a decent size structure with fish averaging 21.6" and 2.1 pounds.

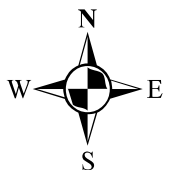
Black crappie have historically been the preferred species for panfish anglers because they tend to reach an acceptable harvest size more regularly than the lake's bluegill. The crappie fishery can be highly variable and generally fluctuates based on spawning success. The 2009 year class, which was a large percentage of the catch in the previous survey, was no longer a significant portion of the catch in 2014. This suggests that anglers likely harvested these fish as they should have been of a size that was captured well in survey nets. The 2011 year class, which made up 40% of the catch, averaged 7.8" at the time of capture and will likely drive the fishery in the near future. While bluegill in Cedar Lake have historically been relatively small sized in our trap net assessments, some fish of preferred sizes were observed for the first time since 1959. Selective harvest of smaller individuals is recommended for bluegill fisheries since excessive angling can readily alter the size structure of their populations.

Cedar Lake (01-0209-00) Gill Net Locations Resurvey - 8/11/2014

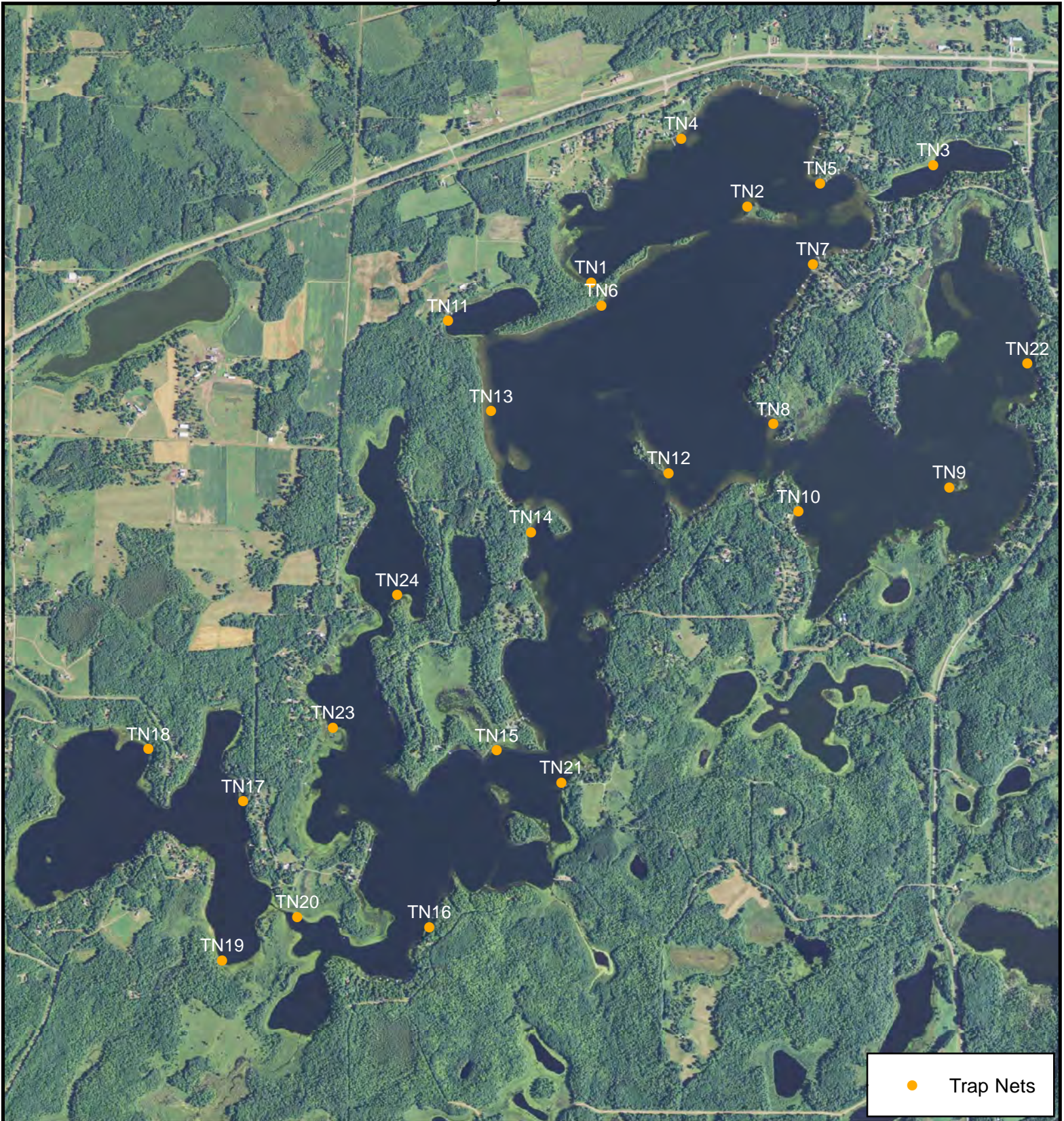


2013 FSA Color Aerial Photography

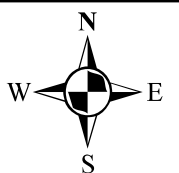
0 0.5 1 2 Miles



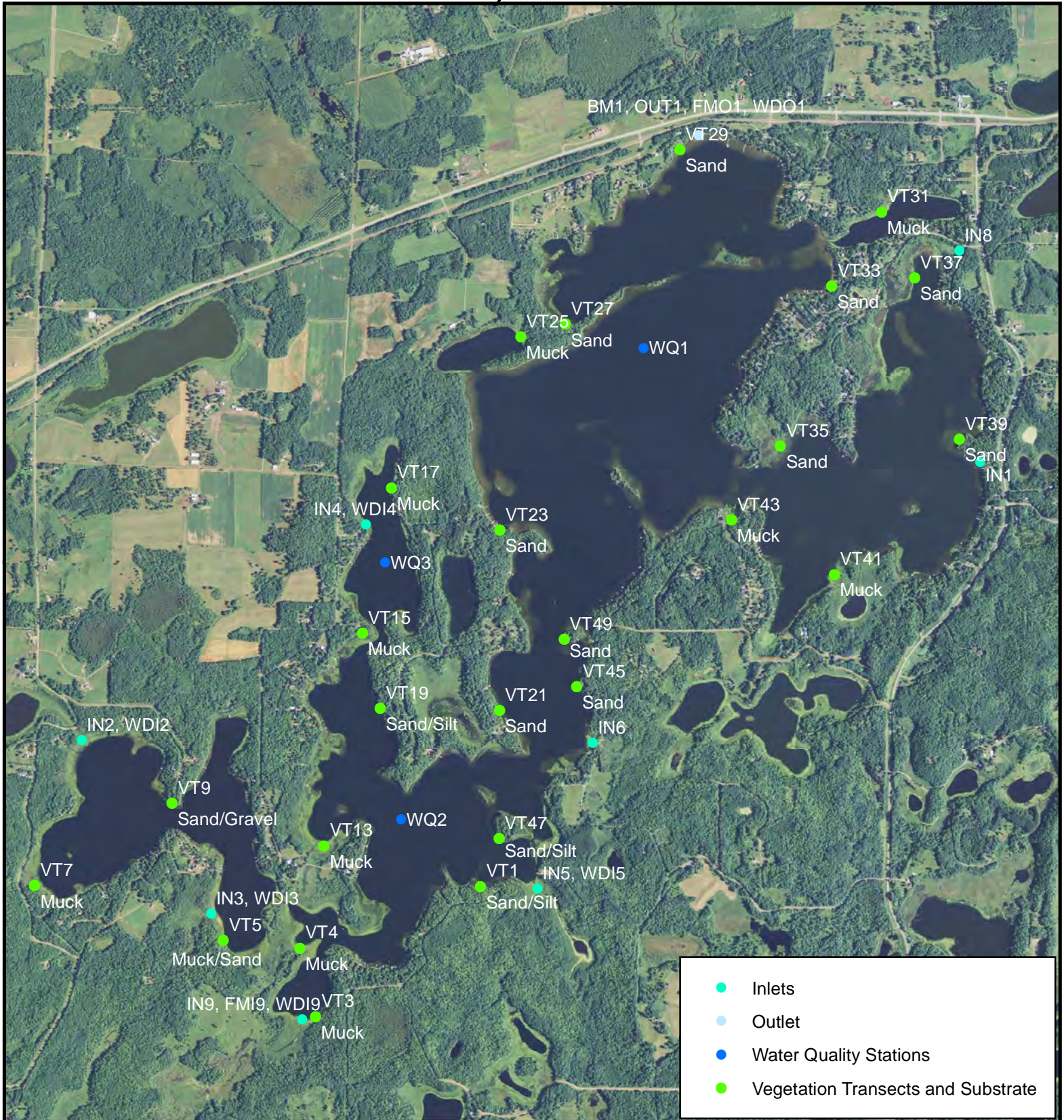
Cedar Lake (01-0209-00) Trap Net Locations Resurvey - 8/11/2014



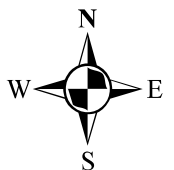
2013 FSA Color Aerial Photography



Cedar Lake (01-0209-00) Habitat Sampling Stations Resurvey - 8/11/2014



2013 FSA Color Aerial Photography



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RE-SURVEY DATED 08/11/2014 FOR DOW NUMBER 01-0209-00

Approval Dates And Notices

Date Approved By Aitkin Area Fisheries Supervisor: 03/31/2015
Date Approved By Northeast Region Fisheries Manager: 04/27/2015



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Standard Lake Survey Report revision: 03/25/2014-RJE. Data Date: 05/06/2015 at 8:45 am .